CLAIMS

What is claimed is:

1. An apparatus for measuring strain, comprising:

a semiconductor film and an adjacent metal shunt forming an interface therebetween;

wherein a strain induced at least at the interface changes a resistance at the interface.

2. The apparatus of claim 1, wherein:

the induced strain comprises a tensile strain.

3. The apparatus of claim 1, wherein:

the induced strain comprises a compressive strain.

4. The apparatus of claim 1, wherein:

the interface comprises a resistive interface.

5. The apparatus of claim 1, wherein:

the interface comprises a Schottky interface.

6. The apparatus of claim 1, wherein:

the semiconductor film comprises an n-type thin film with a thickness of approximately one to ten microns.

7. The apparatus of claim 1, wherein:

the semiconductor film comprises Indium Antimonide.

8. The apparatus of claim 1, wherein:

the metal shunt comprises gold.

9. The apparatus of claim 1, further comprising:

a flexible membrane on which the semiconductor film and metal shunt are carried.

10. The apparatus of claim 9, further comprising:

a frame to which the flexible membrane is attached.

11. The apparatus of claim 1, further comprising:

a semi-insulating substrate on which the semiconductor film and metal shunt are grown.

12. The apparatus of claim 1, wherein:

the semiconductor film and metal shunt are provided in a plate structure having a substantially rectangular geometry and characterized by a filling factor of approximately 9/16.

13. The apparatus of claim 1, further comprising:

a control for obtaining a measurement indicative of the change in the resistance of the interface by applying a constant current to the semiconductor film and the metal shunt to induce a voltage therein, and measuring a change in the voltage that is indicative of the change in the resistance.

14. The apparatus of claim 13, wherein:

the control determines at least one of a pressure and temperature based on the obtained measurement.

15. The apparatus of claim 14, further comprising:

a memory for storing calibration data;

wherein the control accesses the calibration data for use in determining the at least one of a pressure and temperature.

16. The apparatus of claim 1, wherein:

the strain is induced in a direction substantially parallel to a length of the interface.

17. The apparatus of claim 1, wherein:

heights of the semiconductor film and metal shunt are substantially equal.

18. A method for measuring strain, comprising:

applying a constant current to a hybrid semiconductor device comprising a semiconductor film and an adjacent metal shunt forming an interface therebetween to induce a voltage in the hybrid semiconductor device;

inducing a strain at least at the interface to change a resistance at the interface; and

measuring a change in the voltage that is indicative of the change in the resistance.

19. A method for fabricating a semiconductor device, comprising:

growing a thin semiconductor film on a semi-insulating substrate;

defining a semiconductor mesa with a desired lateral dimension by removing a portion of the thin semiconductor film; and

depositing metal onto the substrate to form a metal shunt adjacent to the semiconductor mesa with a desired lateral dimension.

20. The method of claim 19, further comprising:

inducing a strain at least at an interface between the semiconductor mesa and the metal shunt to change a resistance at the interface.

21. A method for determining at least one of a pressure and temperature acting on a sensor, comprising:

exposing a sensor comprising a metal-semiconductor hybrid device carried on a flexible membrane to an environment in which the at least one of a pressure and a temperature acts;

obtaining a measurement indicative of a change in a resistance of the metal-semiconductor hybrid device caused by a deformation of the metal-semiconductor hybrid device that is induced by a corresponding deformation of the flexible membrane; and

determining the at least one of a pressure and temperature based on the obtained measurement.

22. The method of claim 21, further comprising:

accessing calibration data for use in the determination of the at least one of a pressure and temperature.